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ZEUXINE STRATEUMATICA IN FLORIDA

BY
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THE OCCURRENCE of the Asiatic *Zeuxine strateumatica* in Florida was reported in *Orchidologia Zeylanica* 4 (1937) 89. This report was based on a single colony found on January 17, 1937, in a nursery, the Ormond Tropical Gardens, at Ormond in Volusia County. It was suggested that this orchid might have been introduced with nursery stock, but convincing evidence for such an introduction was lacking and efforts to substantiate it met with failure. Records of *Zeuxine strateumatica* having been cultivated in American gardens have not been found. It is not an orchid of horticultural significance and to my knowledge has never been cultivated in our botanic gardens.

Shortly after the discovery of *Zeuxine strateumatica* at Ormond, my attention was directed to a photograph representing several plants of this species collected by George Nelson on January 27, 1936, west of Fellsmere in Indian River County. These plants, unlike those found at Ormond, grew at a distance from cultivated ground. In January, 1938, Nelson again visited the Fellsmere area and reported that *Zeuxine strateumatica* was sparingly distributed over a stretch of two miles and was apparently spreading. The original colony was a small one although composed of numerous specimens.

In December, 1937, Donovan S. Correll brought to my laboratory for identification an orchid which had been collected by Charles C. Deam, on January 30, of that year, twelve miles southeast of Kissimmee in Osceola County. This proved to be conspecific with the Ormond plants and with those found by Nelson near Fellsmere. Later (February, 1938) Correll sent in additional records for the occurrence of the species, indicating its presence in Highlands County, Collier County, Hendry County and Glades County. These were localities visited by Mr. Deam. Then Correll reported that specimens had been found on January 22, 1938, by Miss Mary Singeltary near Kissimmee growing on the edge of a swamp on Johnson Island.

These records indicate very clearly that *Zeuxine strateumatica* is already widespread in peninsular Florida and appears to be adapted to Floridian soil and climate. At the season of anthesis, in 1938, there were frosts in Ormond, but the flowers of the orchid did not show frost-injury although mulberry trees were completely defoliated.

In January, 1938, I again visited the Ormond Tropical Gardens and found an abundance of specimens. Along the edges of a drainage ditch the plants were numerous, in one case fifteen flowering stalks being found in an area of less than one square foot of ground. Some of these specimens were so luxuriant that the lower part of the stems had become procumbent, a condition I have never observed in plants collected in the eastern tropics. The smallest specimens were hardly 4 cm. tall, one of these bearing a single flower, perhaps being a very young plant blooming for the first time.

When I first saw *Zeuxine strateumatica* in lawns of the Ormond Tropical Gardens, I was inclined to believe that it had been introduced from China with seeds of

Centipede Grass (*Eremochloa ophiuroides*). Centipede Grass, now common in Florida as a lawn-grass, was introduced in 1917 from regions in China where *Zeuxine strateumatica* is a native, and the length of time since the introduction of the grass to the United States would seem to be commensurate with the length of time it has taken for the orchid to become naturalized. Protocorms of *Zeuxine* might well have been distributed with stolons of *Eremochloa ophiuroides* and in the course of time might have established themselves in favorable locations. But until we discover definite information in this regard conjecture must of necessity be our only recourse.

As efforts to trace the introduction of *Zeuxine strateumatica* to Florida have failed, it might seem that this is so because the species has been a native for a very long time; that it is a species with representatives in both hemispheres and comparable in this respect to *Eulophia alba* and *Polystachya luteola*, orchids known for many years to be components of the flora of Florida. On this assumption it would have to be argued that the plant has escaped attention until recently and is just coming to the notice of botanists. To argue thus would be quite justifiable if the localities where *Zeuxine strateumatica* has been found were just now being explored for the first time and were remote from travelled paths and from human habitations and if the plants proved to be confined because of their dependence on special soils to limited areas from which they have been unable to spread. But the simultaneity of the reported discoveries of colonies in widely separated areas near thoroughfares and in the vicinity of human dwellings constitute rather convincing evidence that the species is a recent newcomer rather than a native being noticed for the first time in regions where it has escaped observation for untold decades. Intensive botanical exploration has been in progress many

years where the species has been found. Where it occurs it exhibits the propensities of a weed and has become amenable to a diversity of conditions, growing in clipped lawns, under shrubs, along ditches, and thriving equally in sun or shade.

The behavior of *Zeuxine strateumatica* is remarkably unlike that of any other orchid I have observed. As is well known, our native terrestrial species are extremely fastidious. With few exceptions they exhibit intolerance of human contacts. Even though we endeavor to supply the delicate balance of soil conditions revealed necessary by scientific research they seem to resent attempts made to cultivate them in our gardens. *Zeuxine strateumatica* behaves as if it were adapted to the disturbing influences usually associated with cultivated ground and this was strikingly evident in the Ormond Tropical Gardens where the plants survive the clipping of lawns and the cultivation of the soil beneath shrubs.

The roots of the plant are provided with endophytic fungi. From cultures made at the Biological Laboratories by John N. Porter, the fungal symbiont would seem to be a species of *Rhizoctonia* with typical monilioid conidial chains. Attempts to germinate the seeds in association with this fungus have failed, but failure may be the result of the methods used rather than evidence of incompatibility. The likelihood that the fungus isolated is a species other than the one on which mycorrhizal association depends is of course a possibility.

Zeuxine strateumatica is rather unusual in the brevity of its floral maturation in Florida. It comes into flower in January and in a very few weeks sets an abundance of fertile seeds. By the middle of March the withered stems, leaves and inflorescence have completely vanished. In early April I was unable to find a trace of the plant in the Ormond Tropical Gardens and transplanted colonies

in my garden at Ormond, with one exception, were without a vestige of superterranean parts. In passing it may be emphasized that many terrestrial orchids appear to be prevalently subterranean in their nature, the stems, leaves and flowers being but a brief stage in the developmental history. Noteworthy examples of this are the species of *Triphora* including *T. trianthophora*, and the remarkable Australian species *Rhizanthella Gardneri* and *Cryptanthemis Slateri*, the latter a small herbaceous saprophyte wholly subterranean with the exception of the flowers which just reach the surface of the ground. It is as if the production of flowers were but an interlude in the vegetative life of the plant, something incidental to ensure wide distribution of the species. Whether or not the flowers of *Zeuxine strateumatica* are self-pollinated is a question for which the answer is yet to be found, but the rapidity of seed maturation and the abundance of fertile seeds (often polyembryonic) may be regarded as in a measure bound up with the extraordinary rapidity with which the species is becoming established in peninsular Florida.

Zeuxine strateumatica (*Linn.*) *Schlechter* in Engl. Bot. Jahrb. 45 (1911) 394.

Orchis strateumatica Linnaeus Sp. Pl. ed. 1 (1753) 943.

Pterygodium sulcatum Roxburgh Hort. Beng. (1814) 63, *nomen*; Fl. Ind. ed. 2, 3 (1832) 452.

Spiranthes strateumatica Lindley in Bot. Reg. 10 (1824) sub t. 823.

Strateuma zeylanica Rafinesque Fl. Tellur. pt. 2 (1837) 89.

Zeuxine sulcata Lindley Gen. & Sp. Orch. Pl. (1840) 485.

Adenostylis strateumatica Ames Orch. 2 (1908) 59.

EXPLANATION OF THE ILLUSTRATION

ZEUXINE STRATEUMATICA (*Linn.*) *Schltr.* Three plants, drawn natural size, from specimens found growing spontaneously in Ormond, Florida. 1, a side view of the labellum and column. 2, the labellum showing the pandurate lamina and shallow sac. 3, the dorsal sepal. 4, a petal. 5, a lateral sepal. 6, the pollinium. Figs. 1-6 much enlarged.

Drawn in January 1937 by BLANCHE AMES



ZEUXINE *strateumatica* (L.) Schltr.



FLORIDA: Volusia County, Ormond, in the Ormond Tropical Gardens. January 17, 1937, also January 13, 1938. *Ames*: Indian River County, State Road west of Fellsmere. January 27, 1936, also January 21, 1938. *George Nelson*: Osceola County, twelve miles southeast of Kissimmee in moist sand in the bottom of a roadside ditch. January 30, 1937. *Charles C. Deam*; Edge of swamp, Reedy Creek Swamp, Johnson Island, Kissimmee. January 22, 1938. *Mary Singeltary*: Highlands County, along Road 8 south of Lake Placid. February 1, 1938. *Deam*; On State Road just north of Venus. February 1, 1938. *Deam*: Glades County, along road, two to three miles south of Lakeport. February 1, 1938. *Deam*: Hendry County, in mucky soil just south of the levee at Clewiston on border of a swamp. February 2, 1938. *Deam*: Collier County, along roadside north of Naples. February 4, 1938. *Deam*.

ORCHID STUDIES, VI

BY

LOUIS O. WILLIAMS

THE PRESENT NUMBER in my series of orchid studies contains: (1) a synopsis of the Philippine species of *Plocoglottis*, (2) a study of the polymorphic *Ionopsis utricularioides*, (3) a description of a new genus of the *Sarcanthinae* from the Philippine Islands and (4) three new species of orchids from Borneo.

A SYNOPSIS OF THE PHILIPPINE SPECIES OF *PLOCOGLOTTIS* *Blume*

Six species of the genus *Plocoglottis* have been described from material gathered in the Philippine Islands. All of these were described by Ames. An additional species is proposed in the present paper. Among the seven concepts now accredited to the Philippines five appear to be distinct on the basis of the material I have examined.

1. *Plocoglottis bicallosa* *Ames* in *Elmer Leaflet*. Philipp. Bot. 5 (1912) 1571.

Plocoglottis bicallosa is quite easily distinguished from its allies by means of the lacerated lip. Although the leaves are usually narrow, this character is of little value because there is a collection available which shows very broad leaves, quite as broad as the leaves of the other Philippine species. This broad-leaved collection bears the following data: "in forest slopes, Mt. Halcon," Mindoro. At 3000 feet altitude. March 10, 1922. *Ramos & Edaño* 60.

2. *Plocoglottis Copelandii* *Ames* in Philipp. Journ. Sci. 2 (1907) Bot. 326.

Plocoglottis acuminata *Ames* in Philipp. Journ. Sci. 2 (1907) Bot. 326, *nomen nudum* in *synon.*, non *Blume*.

This is the common and most widespread of the Philippine species of *Plocoglottis* and was the first member of the genus to be described from Philippine material.

3. *Plocoglottis bicomata* L. O. Williams sp. nov.

Herba terrestris, usque ad 4 dm. alta. Pseudobulbi grandes, quadrifoliati. Folia lanceolata, acuminata, tri-vel multinervia, longe petiolata. Scapus vaginatus, piloso-pubescent sed basi glaber. Inflorescentia laxa; bracteae triangulari-lanceolatae, acuminatae, pubescentes. Sepalum dorsale anguste oblongum, obtusum, dorso pubescens. Sepala lateralia oblongo-ovata, obliqua, obtusa. Petala lineari-lanceolata, acuta. Labellum subquadratum, apiculatum, quadricallosum et bicomatum, marginibus lateralibus laceratis.

A terrestrial herb up to about 4 dm. tall. Pseudobulb (only one seen) large, about 2.5 cm. long and 1.5 cm. thick, bearing four leaves at its summit. Leaves lanceolate, acuminate, with three prominent and several lesser nerves; blade 15–25 cm. long and 2–3 cm. broad; petioles nearly as long as the blades, sheathing the stem at the base. Scape apparently lateral from the base of the thickened pseudobulb, shortly pilose-pubescent, becoming glabrous below, with several acute sheaths which are reduced to bracts toward the upper portion. Inflorescence lax, about 2 dm. long; bracts triangular-lanceolate, acuminate, pubescent, about 4–7 mm. long. Dorsal sepal narrowly oblong, obtuse, pilose-pubescent on the back, about 7-nerved, slightly concave, 15 mm. long and 5 mm. broad. Lateral sepals oblong-obovate, oblique, obtuse, slightly concave, pubescent on the back, 7-nerved, about 12 mm. long and 6 mm. broad. Petals linear-lanceolate, acute, glabrous, about 14 mm. long and 3 mm. broad at the base. Lip nearly quadrate when expanded, about 7 mm. long and 8 mm. broad, with an apiculation at the apex

on either side of which is a callus; disc with two ovate or oval callus-like thickenings; on the outer side of each of the terminal calli is a lacerated membrane or coma of coarse hairs; lateral margins of the lip serrated. Column slightly arched, glabrous, 7–8 mm. long.

Plocoglottis bicomata is not closely allied to any of the other Philippine species of *Plocoglottis*. It may be distinguished from all of them by the large pseudobulbs, by the two tufts of hair, by the two large terminal calli on the lip and by the two large callus-like thickenings on the disc of the lip. *Plocoglottis bicomata* appears to be closely allied to *Plocoglottis pubiflora* Schltr., a native of New Guinea. I have not seen specimens of the New Guinea species, but from the description it seems to be amply distinct.

By vegetative characters, *Plocoglottis bicomata* is not easily distinguished from the other Philippine species, but because of the two patches of pubescence and the two large thickenings on the lip, this is perhaps the most distinctive *Plocoglottis* known from the Philippines.

LUZON: Rizal Province, Paningtingan. March 1915, *Loher s. n.* (TYPE in Herb. Ames No. 44335); Rizal Province, Sumag. April 1914. *Loher s. n.*

4. *Plocoglottis lucbanensis* Ames in Elmer Leaf.
Philipp. Bot. 5 (1912) 1572.

Plocoglottis lucbanensis may be recognized without much difficulty by the small distinctively shaped lip and by the compact inflorescence.

5. *Plocoglottis mindorensis* Ames in Philipp.
Journ. Sci. 2 (1907) Bot. 327.

Plocoglottis Wenzelii Ames Orch. 5 (1915) 101.

Plocoglottis McGregorii Ames Orch. 7 (1922) 121.

This species appears to embrace a group of rather

variable plants regarding which it is difficult to reach a satisfactory basis for segregation. Indeed, I am not sure that the three concepts cited above should not all be referred to *Plocoglottis Copelandii* Ames. When the abundant material now available is taken into account, there are no characters given in the original descriptions by which these three concepts may be separated. I have been unable to find characters which are constant.

IONOPSIS UTRICULARIODES, A POLYMORPHIC SPECIES

I have recently studied a number of specimens of *Ionopsis* from South America sent to the Ames Herbarium for determination. These specimens raised the question of the proper specific name for the plant which has generally been named *Ionopsis paniculata* Lindl. of which the identity has been investigated with the aid of available material. Two species, which I have not seen, from the Cordilleran region of South America, may belong to this complex. These are *Ionopsis orchiioides* Kränzl. in Fedde Repert. 17 (1921) 388 and *I. zebrina* Kränzl. in Notizbl. Bot. Gart. Berlin 7 (1920) 435. The former may be a synonym of *I. utricularioides*, but the latter, if it is well characterized, may prove to be distinct.

The synonymy which follows belongs, I believe, to *Ionopsis utricularioides*, a widespread and polymorphic species.

***Ionopsis utricularioides* (Sw.) Lindley** Coll. Bot. (1821) t. 39A; Gen. & Sp. Orch. Pl. (1833) 194; Fol. Orch. *Ionopsis* (1852) p. 2—Reichenbach filius in Walp. Ann. 6 (1863) 684—Hemsley in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1884) 290—Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 174—Ames in Proc. Biol. Soc. Wash. 17 (1904) 116; Orch. 1 (1905) 19, t. 5—Fawcett & Rendle Fl. Jam. (1910) 125, t. 27, figs. 4–6—Schlechter in Fedde Repert. Beihefte 8 (1921) 165.

Epidendrum utricularioides Swartz Prodr. Veg. Ind. Occ. (1788) 122.

Dendrobium utricularioides Swartz in Nov. Act. Upsal. 6 (1799) 83.

Ionopsis pulchella Humboldt, Bonpland & Kunth Nov. Gen. et Sp. 1 (1815) (Quarto ed.), 348, t. 83—Lindley Fol. Orch. Ionopsis (1852) p. 3—Reichenbach filius in Walp. Ann. 6 (1863) 684—Schlechter in Fedde Repert Beihefte 7 (1920) 276.

Iantha pallidiflora Hooker Exot. Fl. 2 (1824) t. 113.

Ionopsis pallidiflora Lindley in Bot. Reg. 22 (1836) sub t. 1904; Fol. Orch. Ionopsis (1852) p. 2—Reichenbach filius in Walp. Ann. 6 (1863) 684.

Ionopsis tenera Lindley in Bot. Reg. 22 (1836) t. 1904—Lindley & Paxton in Paxton's Flow. Gard. 2 (1851) 13, f. 141—Lindley Fol. Orch. Ionopsis (1852) p. 2, with varieties A-E—Reichenbach filius in Walp. Ann. 6 (1863) 684.

Ionopsis paniculata Lindley in Bot. Reg. 22 (1836) sub t. 1904; Fol. Orch. Ionopsis (1852) p. 4—Reichenbach filius in Walp. Ann. 6 (1863) 685—Bateman in Bot. Mag. 91 (1865) t. 5541; Second Cent. Orch. Pl. (1867) t. 184—Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 172, t. 41—Hoehne in Comm. Linh. Tel. Estrat. Matto Grosso, Anexo 5, Bot. pt. 1 (1910) 57 and in Atlas t. 45—Schlechter in Fedde Repert. Beihefte 10 (1922) 76.

Ionopsis zonalis Lindley & Paxton in Paxton's Flow. Gard. 2 (1851) 13, *in textu*.

In addition to the names cited above, Lindley (Fol. Orch. Ionopsis (1852) p. 3) gave four others under *I. tenera* to which he referred as forms in an explanatory paragraph. They are (B.) *zonalis*, (C.) *tomentosa*, (D.) *effusa* and (E.) *violacea*.

Cogniaux (in Mart. Fl. Bras. 3, pt. 6 (1864) 175)

included these same names under *Ionopsis utricularioides* as varieties and ascribed them to Lindley. In addition to these four varieties he cited var. *latifolia* Cogn. and var. *angustifolia* Cogn.

Three other varietal names which without doubt belong to this complex are *Ionopsis paniculata* var. *maxima* L. Lind. & Rodigas in *Lindenia* 3 (1887) 39, t. 114, *I. paniculata* var. *grandiflora* Hort. ex Stein Orchideenb. (1892) 282 and *I. utricularioides* var. *parviflora* Schltr. in *Fedde Repert. Beihefte* 17 (1922) 74.

These several varietal names, to which reference is made in the preceding three paragraphs, are hardly more than horticultural forms and have little scientific value.

A few comments concerning some of the specific synonyms of *Ionopsis utricularioides* follow:

Ionopsis pulchella—my knowledge of this name is based on the plate cited. There can be little doubt but that it belongs to this complex species.

Ionopsis pallidiflora—my knowledge of this name is based on Hooker's plate cited above under *Iantha pallidiflora*. The only difference worthy of note is in the tip of the spur which is slightly retuse. This character is hardly of specific value.

Ionopsis tenera—the plate cited above leaves little doubt regarding the affinity of the plant bearing this name.

Ionopsis paniculata—this is the most luxuriant form of *I. utricularioides*. It is apparently not uncommon in South America and occasional in the Caribbean region. H.G. Reichenbach thought it doubtful whether *I. paniculata* could be kept distinct from *I. utricularioides* (cf. *Walp. Ann.* 6. (1863) 686).

Ionopsis utricularioides is one of the most widely distributed of the tropical American species of orchids. It occurs from Florida and the Caribbean region to Mexico

and Central America; through a large portion of northern South America and is one of the five orchids known to occur on the Galapagos Islands. In a species occurring over such a vast region one would expect to find considerable variation, and it is owing to this variation that we may ascribe the many synonyms, not to mention the fact that the plant has been frequently cultivated and variously named for horticultural purposes.

A NEW GENUS OF THE SARCANTHINAE

Phragmorchis *L. O. Williams gen. nov.* Orchidacearum—Sarcanthinae—Aerideae.

Sepala lateralibus ad apicem ovarii affixa, a columna libera. Sepalum dorsale liberum, naviculare. Petala sepalis similia sed minora. Labellum basi columnae affixum, in saccum aut calcar apice paulo bidentatum productum, antice in laminam ovatam productum, prope laminae basim in calcar callis duobus tenuibus ornatum; lobi laterales erecti, parvi. Columna mediocris, cylindracea, apoda, exalata, rostello brevi. Pollinia globosa, paulo fissa; stipes tenuis, a basi usque ad apicem sensim dilatata; glandula ovata, parva.

Herba epiphytica, caulescens cum foliis angulariteretibus. Species una adhuc nota, habitu Schoenorchidis.

Caulescent, epiphytic herbs with angular-terete leaves. Lateral sepals adnate to the apex of the ovary, free from the column. Dorsal sepals free, navicular. Petals similar to the sepals but smaller. Lip adnate to the base of the column, prolonged at the base into a sac or spur which has a slightly bidentate tip; produced into an ovate blade in front; near the base of the blade (mid-lobe) in the spur are two slender calli; lateral lobes of the lip erect, small. Column medium-sized, cylindric, without a foot, without stelidia; rostellum short. Pollinia two, globose, each one slightly divided; stipe slender,

slightly dilated from the base toward the apex; gland ovate, small.

Phragmorchis teretifolia *L. O. Williams sp. nov.*

Herba epiphytica cum caulibus gracilibus, usque ad 4.5 dm. altis. Folia subulata, teretia. Inflorescentia lateralis, brevis, pauciflora; bracteae parvae, triangulari-acuminatae. Sepalum dorsale naviculare, obovatum, breviter apiculatum, uninervium. Sepala lateralia oblongo-ovata, leviter obliqua, acuta. Petala oblongo-lanceolata, obtusa vel acuta, uninervia. Labellum trilobatum, valde saccatum vel calcaratum, bicallosum; lobus medius late ovatus, paulo carinatus; lobi laterales erecti, apice acuti.

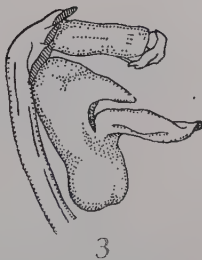
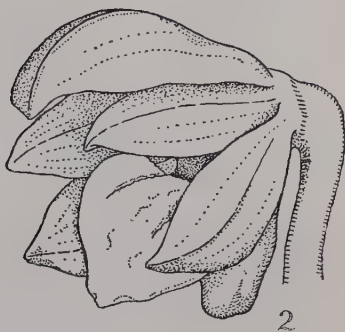
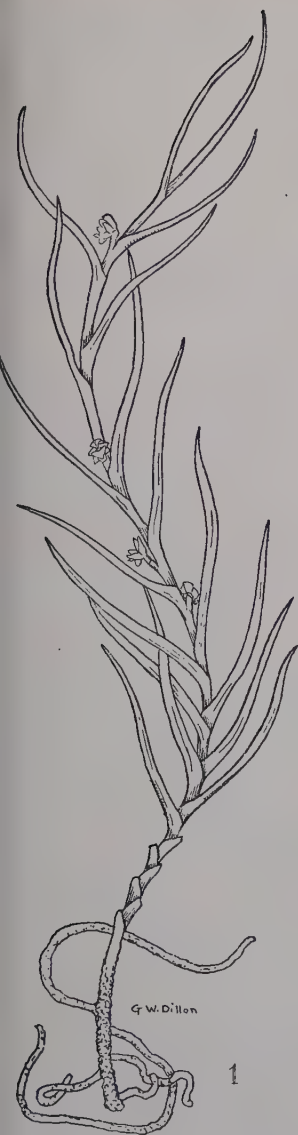
An epiphytic herb with slender stems, up to 4.5 dm. long. Roots short, strongly verrucose (at least when dry). Stems slender, terete, covered with the persistent bases of the old leaves, 2–3 mm. thick. Leaves subulate, angular-terete, up to about 6 cm. long and 3 mm. thick. Inflorescences lateral, short, few-flowered, several from each stem, breaking through the leaf-sheaths opposite the base of a leaf. Bracts of the inflorescence small, triangular-acuminate, about 2 mm. long. Dorsal sepal navicular, obovate, short-apiculate, 1-nerved, about 4 mm. long and 2 mm. broad. Lateral sepals oblong-ovate, slightly oblique, acute, about 4 mm. long and 1.5 mm. broad. Petals oblong-lanceolate, obtuse or acute, 1-nerved, about 4 mm. long and 1 mm. broad. Lip 3-lobed, strongly saccate or spurred, with two very thin callus plates in the spur near the base of the mid-lobe of the lip; mid-lobe broadly ovate, somewhat carinate, about 2 mm. long and 1.5 mm. broad; lateral lobes erect, free from the column, about 1 mm. long, the acute apex of of the lobes directed outward. Anther cucullate, apiculate-acuminate, on the apex of the column, about 1.5 mm. long and 1 mm. broad. Rostellum minute, in the

EXPLANATION OF THE ILLUSTRATION

PHRAGMORCHIS TERETIFOLIA *L. O. Williams*. 1, plant, drawn about one fourth natural size. 2, flower, enlarged about three and one half times. 3, lateral view of column and lip (sepals and petals removed), enlarged about three and one half times. 4, column seen from below, enlarged about five times. 5, anther, enlarged about three and one half times. 6, pollinia, enlarged about five times.

Drawn by G. W. DILLON

PHRAGMORCHIS TERETIFOLIA
L.O. Williams



upper part of the very large, deep, stigmatic cavity. Pollinia two, globose, each one slightly furrowed and thus divided into a large and a small perfectly joined mass; the pollinia are attached to the rostellum by a stipe which passes (in a groove) from the apex of the column to the rostellum which is about 0.5 mm. below.

PHILIPPINE ISLANDS: Luzon, Rizal Province. September 1909. *Loher 14744* (TYPE in Herb. Ames No. 46300; ISOTYPES in Herb. Bur. Sci., Manila, in Herb. Kew. and in Herb. Mo. Bot. Gard.).

The genus *Phragmorchis* seems to be most closely allied to *Schoenorchis*. It should doubtless be placed between *Schoenorchis* and *Sarcanthus* in the system proposed by Schlechter in Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem 9 (1926) 563-591.

Phragmorchis may be distinguished from all other genera of the *Sarcanthinae* known to me, by a combination of the following characters: a very small (almost minute) rostellum; a straight footless or nearly footless exalate column; a deep groove from the clinandrium to the rostellum in which the stipe of the pollinia lies; a very large stigmatic cavity; the lateral lobes of the lip being free from the column; the spur or sac with only two very thin, inconspicuous calli at the base of the mid-lobe of the lip; the terete leaves which are angled (at least when dry); and a very short few-flowered inflorescence.

THREE NEW SPECIES OF ORCHIDS FROM BORNEO

The orchids described below are among a collection sent by the Botanic Gardens, Singapore, Straits Settlements to the Ames Herbarium for study and determination. The specimens were collected by Major J. C. Moulton in Borneo. The three species described here are of particular interest, but many of the other specimens are of rare species.

***Dendrochilum pubescens* L. O. Williams sp. nov.**

Herba epiphytica, usque ad 2.5 dm. alta. Folia oblanceolata, acuta, fulvo- vel nigropubescentia, septemnervia. Inflorescentia folium superans; bracteae nigropubescentes. Sepala lanceolata, acuta, paulo carnosae, dorso paulo pubescentia. Petala oblongo-lanceolata, acuta, paulo carnosae, obscure crenulata. Labellum oblongo-ovatum, acutum, integrum sed parte inferiore paulo laceratum, carnosum, tricallosum. Stelidia prope columnae medium stant.

An epiphytic herb up to about 2.5 dm. tall. Pseudobulbs ovate, sulcate when dry, about 2.5 cm. long and 1 cm. thick; young floriferous pseudobulbs small, subtended by several pubescent chartaceous sheaths. Leaves oblanceolate, acute, shortly black- or brown-pubescent on the back, slightly less pubescent on the upper surface, with three prominent and four less prominent nerves, about 25 cm. long and 3.5 cm. broad above the middle. Flowering peduncle evidently surpassed by the mature leaves but surpassing the subtending leaf, black-pubescent. Bracts of the inflorescence black-pubescent, about 5 mm. long. Dorsal sepal lanceolate, acute, somewhat fleshy, sparingly pubescent on the dorsal surface, 7-8 mm. long and 3-3.5 mm. broad. Lateral sepals similar to the dorsal sepal. Petals oblong-lanceolate, acute, somewhat fleshy, obscurely crenulate, about 6 mm. long and 2.5-3 mm. broad. Lip oblong-ovate, entire but the lower half more or less lacerated, acute, fleshy, about 5 mm. long and 2.5-3 mm. broad; near the base of the lip is a large thickening which has two lateral ridges. Column about 3 mm. long; stelidia near the middle of the column, acute, about 1 mm. long; rostellum prominent, triangular.

Dendrochilum pubescens has no near allies in Borneo with which it is likely to be confused. It may be distin-

guished from all species of *Dendrochilum* known to the author, by the black or brownish pubescence on the leaves, sheaths, flowering scape and sepals.

BORNEO: Gunong Temabok, Upper Barami Valley. At 3000 feet altitude. November 8, 1920. *Moulton 6763* (TYPE in Herb. Ames No. 48305).

***Pholidota gracilis* L. O. Williams sp. nov.**

Herba tenella, epiphytica, usque ad 4 dm. alta. Folia linearia, acuta vel acuminata, nervosa, sub apice paulo constricta. Pedunculus gracilis, foliis aequalis; racemus distichus, pauciflorus, laxis; bracteae oblongo-ovatae, obtusae, scariosae. Sepalum dorsale late lanceolatum, acutum, trinervium, naviculare. Sepala lateralibus ovato-lanceolata, acuminata, paulo obliqua, trinervia. Petala lanceolato-rhombica, acuta, trinervia. Labellum saccatum, trilobatum, supra medium bicallosum; lobi laterales erecti, oblongi; lobus medius late lanceolatus, acutius, recurvatus. Columna generis.

A slender epiphytic herb up to 4 dm. tall. Pseudobulbs small, more or less cylindric, monophyllous, up to 2 cm. long. Leaves linear, acute or acuminate, several-nerved, somewhat constricted just below the apex, up to 30 cm. long and 1 cm. broad. Peduncle slender, as long as the leaves; raceme distichous, few-flowered, rather lax, about 6 cm. long; flowers alternate, about 4 mm. apart; bracts oblong-ovate, obtuse, scarious, striated, about 5 mm. long and 3.5 mm. broad. Dorsal sepal broadly lanceolate, acute, 3-nerved, navicular, about 4 mm. long and 2 mm. broad. Lateral sepals ovate-lanceolate, acuminate, slightly oblique, 3-nerved, about 5 mm. long and 2-2.5 mm. broad. Petals lanceolate-rhomboid, acute, 3-nerved, about 4 mm. long and 1.5 mm. broad. Lip saccate, 3-lobed, with two prominent calli just above the mid-lobe, the calli free and forming mammillae at their lower points; lateral lobes erect, oblong, length

from the tip of the lateral lobes to the lowest part of the sac about 2 mm. ; mid-lobe broadly lanceolate, acute, strongly recurved, about 2.5 mm. long and 1–1.3 mm. broad. Column slightly arcuate, about 2 mm. long; rostellum linear-lanceolate, about 0.7 mm. long.

I have been unable to find any close allies of *Pholidota gracilis*.

BORNEO: Gunong Temabok, Upper Barami Valley. At 3000 feet altitude. November 8, 1920. *Moulton 6762*. (TYPE in Herb. Ames No. 48306).

***Pholidota Schweinfurthiana* L. O. Williams sp. nov.**

Herba epiphytica, gracilis, usque ad 2 dm. alta. Folia lineari-oblancheolata, acuta, nervosa. Pedunculus tenellus; racemus brevis, pauciflorus, distichus; bracteae late lanceolatae, acuminatae, scariosae. Sepalum dorsale late ovatum, obtusum, trinervium, naviculare, dorso lepidotum. Sepala lateralia ovata, obtusa, trinervia. Petala late ovata, obtusa vel acuta, paulo obliqua, trinervia. Labellum obscure trilobatum, saccatum, callis binis prope lobos laterales parvos et callo medio prope sacci basim ornatum; lobi laterales parvi et obscuri, acuti, prope labelli medium; lobus medius reflexus, retusus, quadratus. Columna generis.

A slender epiphytic herb up to 2 dm. tall. Pseudobulbs obpyriform, monophyllous, up to 2 cm. long. Leaves linear-oblancheolate, acute, somewhat plicate (at least when dry), several-nerved, 10–20 cm. long, 7–9 mm. broad. Peduncle slender; raceme short, fractiflex, few-flowered, distichous, up to about 3 cm. long; flowers alternate, about 4 mm. apart; bracts broadly lanceolate, acuminate, scarious, striated, about 8 mm. long and 4 mm. broad. Dorsal sepal broadly ovate, obtuse, 3-nerved, navicular, lepidote dorsally, about 3 mm. long and 2.5 mm. broad. Lateral sepals ovate, obtuse, 3-nerved, lep-

idote dorsally, about 3.5 mm. long and 2.5 mm. broad. Petals broadly ovate, obtuse or acute, slightly oblique, 3-nerved, about 3 mm. long and 2.5 mm. broad. Lip obscurely 3-lobed, saccate, about 4 mm. long and 2-3 mm. broad, with two prominent mammillate calli near the small lateral lobes and a central thickening near the base in the sac; lateral lobes small and obscure, near the middle of the lip; mid-lobe strongly reflexed, slightly retuse, quadrate, about 2 mm. long and 2 mm. broad. Column about 2 mm. long, with a broad wing on either side.

Pholidota Schweinfurthiana is very closely allied to *Pholidota pectinata* Ames and might easily be confused with that species on a superficial examination. *Pholidota Schweinfurthiana* may be distinguished from *P. pectinata* by the following characters:

P. Schweinfurthiana

Calli of lip mammillate.
Lip obscurely 3-lobed.
Mid-lobe of lip no broader than the basal half of the lip.

Sepals and petals comparatively broad.

Raceme of flowers markedly fractiflex.

P. pectinata

Calli of lip elongated.

Lip simple.

Middle part of the lip much broader than the basal half, nearly twice as broad.

Sepals and petals comparatively narrow.

Raceme of flowers not markedly fractiflex.

It is indeed a pleasure to name this species in honor of my colleague, Mr. Charles Schweinfurth, who, several years ago indicated its distinctness.

BORNEO: Gunong Temabok, Upper Barami Valley. At 4000 feet altitude. November 5, 1920. Moulton 6678. (TYPE in Herb. Ames No. 48307).

A NEW BLETIA FROM MEXICO

BY

CHARLES SCHWEINFURTH

IN A SMALL COLLECTION of orchids from northern Mexico collected by H.S.Gentry and sent for determination by Dr. Forrest Shreve of the Desert Laboratory (at Tucson, Arizona) of Carnegie Institution of Washington, appeared the following species which seems to be undescribed.

Bletia amabilis C. Schweinfurth *sp. nov.*

Herba terrestris, speciosa. Folia plura, prope basim, imbricantia, elliptico-lanceolata vel lineari-elliptica, longe acuminata, vaginis duabus cylindraceis fulta. Caulis fistulosus, glaber. Racemus laxis. Flores spectabiles, grandes. Sepalum dorsale elliptico-oblongum, acutum. Sepala lateralia oblongo-elliptica, acuta. Petala obovato-oblonga. Labellum medio profunde trilobatum; lobi laterales semiobcordati; lobus medius obcordatus, profunde bifidus. Discus carinis quinque percursus. Columna valde arcuata, superne dilatata.

Plant terrestrial, up to about 9.4 dm. tall (doubtless becoming taller). Base of the plant enveloped by two imbricating tubular scarious sheaths which appear to be finely more or less reddish-maculate, from above these bracts issues a cluster of three imbricating erect-spreading leaves. Leaves elliptic-lanceolate to linear-elliptic, up to about 23.5 cm. long and 5 cm. wide (the uppermost much narrower), long-acuminate, convolute, many-nerved with five to seven more prominent nerves, sub-membranaceous. Stem stout, fistulose, glabrous, provided below with one tubular appressed scarious sheath which is 3 cm. long. Raceme very loosely 12-flowered, arcuate-flexuous near the summit, about 23 cm. long

inclusive of the terminal buds. Floral bracts ovate-lanceolate, very long-acuminate, concave, many-nerved, the lowest one about 1.8 cm. long. Flowers large and showy, rather membranaceous. Dorsal sepal elliptic-ob lanceolate, acute, about 4 cm. long and 1.4 cm. wide, 7-nerved with numerous reticulations. Lateral sepals oblong-elliptic, acute, about 4.1 cm. long and 1.5 cm. wide, 8- to 9-nerved. Petals obovate-oblong, falcate, nearly 4 cm. long, about 1.5 cm. wide, very shortly acute or subacute, 6- to 8-nerved in the middle with numerous reticulations. Lip deeply 3-lobed near the middle with the mid-lobe deeply bilobed, about 4.2 cm. long to the tip of a terminal lobule, about 3.1 cm. wide across the widest part of the lateral lobes, very shortly clawed and abruptly rounded to subcordate at the base; lateral lobes semiobcordate, broadly rounded at the apex, about 1.3 cm. wide where broadest; mid-lobe nearly sessile, obcordate, minutely but broadly apiculate in the deep median sinus, about 2 cm. long to the tip of a lobule and 2 cm. wide near the apex, with the margins irregularly crenulate and undulate-plicate. There are five approximate median keels which are scarcely more than thickened nerves through the basal third of the lip, are abruptly dilated into high thin semielliptical plates near the middle of the lip, and then decrease into low keels of which the outer pair are relatively lower and extend about to the center of the mid-lobe; the inner pair which are higher than the outer pair are gradually dilated to an abruptly truncate apex near the anterior third of the mid-lobe; the central keel, which is lower but stouter than the ones beside it, is slightly dilated at its apex where it terminates close to the median sinus of the mid-lobe. Column strongly arcuate, gradually dilated above, about 3 cm. long, winged on each side with the wing some-

what dilated just above the base; margins of the clinandrium irregularly lobulate.

Another specimen of the same collection shows the following discrepancies. A detached fragment consists of a moniliform cluster of three small approximate ellipsoid rugose corms which produce fibrous flexuous roots; two of these corms are adorned at the summit with the short remnants of a stem. The entire plant is smaller in all parts than the type; the cauline bract is somewhat above the middle of the stem and three of the flowers of the shorter raceme appear to issue from one point of the rachis.

Another collection (*Gentry 2473*), which is referable to this species, appears to be in an advanced stage of anthesis, since it bears two immature capsules and a single flower at the summit of the raceme. It differs from the type in having commonly longer leaves (the uppermost of the three blades 31.6 cm. long), in having a rather lax raceme (about 30.5 cm. long) and smaller flowers of which the segments are 3 cm. or less in length.

This species appears to be allied to *Bletia campanulata* La Llave & Lex., which is a plant difficult to interpret adequately. It differs from our conception of that species, however, in its somewhat broader leaves, broader lateral lobes and deeply bilobed mid-lobe of the lip which bears yellow markings. It lacks the striking claw of the mid-lobe of the lip which characterizes *B. macristhmochila* Greenm.

MEXICO: State of Sonora, Sierra Charuco, Rio Mayo. "Upper Sonoran; oaks, shaded humus. . . . Terrestrial in soil. Fl. lavender, laterals yellow with purple veins, upper lip purple". July 23, 1936. *Howard Scott Gentry 2302* (TYPE in Herb. Ames No. 49093): State of Chihuahua, Guasaremos, Rio Mayo. "Upper Sonoran; tolerant oak slope. . . . Terrestrial with lavender flowers". August 26, 1936. *Gentry 2473*.

